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ABSTRACT

This paper discusses the results of a study comparing the language of preschool children from low-income homes to that of their parents as affected by the adult participation in training sessions planned to encourage language development. The study was conducted in three preschools in the Detroit metropolitan area. A total of 96 children from ages 2 1/2 to 5 participated; 56 children were randomly selected for the experimental group and 40 for the control group. Parents were placed in experimental or control groups, according to their children's assignment. The parents were given 12 training sessions on topics generally related to language and cognitive development at the preschool level; they were also given tasks to carry out with the child at home. Spontaneous speech was obtained from the children as pretest and posttest measures. The responses were analyzed on two levels. The results of the first level analysis, analysis of communication units and mazes, are discussed in this paper. The results are mixed and seem to indicate that parent involvement is only one factor influencing performance. (CFM)

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ORAL LANGUAGE OF PRESCHOOL CHILDREN:

FIRST LEVEL ANALYSIS

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Purpose of the Study

This study is part of a larger project funded by the U.S. Office of Education. The funded project aims to explore if training provided to low-income parents and tasks they carry out with their own children would effectuate better performance by the children on language and concept development in preschool, on reading readiness tasks in kindergarten and in reading in the elementary grades. Within this projected longitudinal study is a substudy of the language of these preschool children and their parents. This paper reports only the results of the first level analysis of the oral language of the preschool children. Results of the second level analysis of the oral language of these children are reported in a separate paper. (Liu, 1978)

The purpose of the two-level analysis is to examine in depth the oral language of these preschool children and to investigate any possible effect of the training provided their parents on their oral language development.

Background

Logan's longitudinal study (1963, 1966, 1969, 1976) of language development of the same group of children from age five to eighteen provides a framework for the present study. Loban found that oral language correlates with reading achievement and writing performance throughout the elementary and socondary grades. Students with lower oral language proficiency also achieved lower in reading and in writing. Further-

more, language efficacy seems to be related to socio-economic class. "...those who use the full resources of language usually come from families with reasonably good socio-economic status." (Loban, 1976:87)

Loban's study began with children of kindergarten age. This study can be viewed as an extension of the Loban study with younger children in the preschool.

Design of the study

The study was conducted in three preschools in the metropolitan Detroit area: Duffield Preschool in Detroit, Wayne State University Nursery at Jeffries Homes, and the Westwood Child Development Center in Westwood, Michigan

A total of 96* children from age 2 1/2 to age 5 participated in the study. Fifty-six children were randomly selected for the experimental group and 40 children in the control group. Their parents were placed in experimental or control groups according to their children's assignment.

Treatment of the project consisted of twelve training sessions for parents on topics generally related to language and cognitive development at preschool level. Parents were also given a number of tasks to carry out with their own children at home between January and May, 1977. Examples of tasks include reading aloud to children, labeling objects, science experiments with colors and

*Due to incomplete data of some children, this original number was reduced for this substudy.

plants, and prereading visual discrimination tasks on similarities and differences. No treatment was designated for specific language development.

Independent variables include age, ethnic backgroup, and sex of the children and parents, and levels of education and income of parents. Dependent variables include the pre and post test results of the Test of Basic Experiences (TOBE), the Reading Readiness Test for Disadvantaged Preschool Children (PREP), the pre and post oral language analysis of the children, and the language analysis of the parents.

Methodology

Spontaneous speech was obtained from each child by presenting him individually with five pictures. This was done as a pretest measure in December, 1976 and as a posttest in May, 1977. The pictures were carefully selected to provide interest and a degree of puzzlement to elicit full responses from children. After some warm-up conversation to establish rapport, the interviewer followed the interview procedures used in the Loban study (1976, pp. 133-134). All responses were tape-recorded and were transcribed later on prepared forms by persons trained by the investigator on a set of uniform procedures.

The transcribed responses were analyzed at two levels: the first level on communication units and mazes; the second level on noun phrase and verb phrase complexity which includes an adjustment for dialect, modification introduced in this study. (Liu, 1978).

For the First Level Analysis the children's responses were analyzed into communication units and mazes--two objective methods for segmenting the flow of oral language employed by Loban (1976). Loban defines a communication unit (C-unit) as an independent clause with its modifiers, the same definition given by Kellogg W. Hunt for segmenting writing as a T-unit. (Loban, 1976, p. 9) The rationale for using the C-unit in analyzing oral language and in using the T-unit in segmenting writing is that the average length of the C- or T-unit is a significant index of language maturity.

In oral language, one often becomes confused or tangled in words. Loban terms these linguistic tangles "mazes." A maze is "a series of words (or initial parts of words), or unattached fragments which do not constitute a communication unit and are not necessary to the communication unit." (Loban, 1976, p. 10) It is possible to compute average words per maze and the number of mazes as a percentage of total words to derive at some measure of a person's degree of linguistic uncertainty.

Results

The results on the total number of communication units and mazes, average number of words per communication unit, and words in mazes as percentage of total words are presented below. The data for the three preschools are combined and results for all groups are reported in this paper.

TOTAL NUMBER OF COMMUNICATION UNITS AND MAZES

In Table 1, a total of 9,311 words on the pretest of the experimental group was analyzed into 2,255 communication units with a total of 580 mazes, and a total of 10,231 words on the posttest was analyzed into 1,958 communication units with 812 mazes yielding a total of 19,542 words into 4,213 communication units with 1,392 mazes.

In the experimental group, mean number of communication units decreased slightly from pre to posttest, from an average of 46.98 to 40.79 per child for the 48 children in this group. Average number of words used, however, increased from 193.98 to 213.15. Mazes also increased from 12.08 to 16.92.

In the control group there was a decrease in average communication units and words used. On the pretest the 28 children in this group averaged 65.07 communication units and 269.71 words. Their posttest scores were 44.14 and 232.25, respectively. Mazes increased from 17.07 to 21.00.

TABLE 1

TOTAL NUMBER OF COMMUNICATION UNITS AND MAZES ANALYZED

	EXP PRE	PERCENT.	EXP POST	PERCENT.	EXP TOTAL
Total # communication Units	2255	46.98	1958	40.79	4213
Total # of Words	9311	193.93	10231	213.15	19542
Total # of Mazes	580	12.08	812	16.92	1392

	CONT PRE	PERCENT.	CONT POST	PERCENT.	CONT TOTAL
Total # Communication Units	1822	65.07	1236	44.14	3058
Total # of Words	7552	269.71	6503	232.25	14055
T otal # of Mazes	478	17.07	588	21.00	1066

	EXP & CONT TOTAL
Total # Communication Units	7271
Total # of Words	33597
Total # of Mazes	2458

AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT

Pre-Test Equivalency

In order to establish equivalency of the pretest scores of the experimental and the control groups, a *t-test was performed on the average number of words per communication unit. The results show no significant difference between the experimental and the control groups.

Pre-Post Test Comparison

The forty-eight children in the experimental group had a mean of 4.052 words for each communication unit on the pretest with a standard deviation of 1.111. The increase of 1.084 is significant at $p < .01$. The twenty-eight children in the control group had a mean of 4.040 on the pretest with a standard deviation of 1.171 and a mean of 5.171 on the posttest with a standard deviation of 1.015. The increase from pre to post test of 1.132 is also significant at $p < .01$. However, the gains in the experimental group were not significantly different from those in the control group (Table 2).

TABLE 2

AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT: MEANS, STANDARD DEVIATIONS AND GAIN SCORES OF PRE-POST TEST BETWEEN GROUPS

		MEAN			STANDARD DEVIATION		
GROUP	N	PRE	POST	GAIN	PRE	POST	DIFFERENCE
EXP	48	4.052	5.136**	1.084	1.060	1.111	1.082
CONT	28	4.040	5.171**	1.132	1.171	1.015	0.961

*Mean t-test sig. at $p < .01$ for a 1-tailed test.

Post Test Results

The posttest shows in Table 3 the experimental group with a mean of 5.0926 and a standard deviation of 1.117 and the control group with a mean of 5.1713 and a standard deviation of 1.015 resulting in a t = .31 which is not significant.

TABLE 3

AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT: MEANS AND STANDARD DEVIATIONS OF POSTTEST

GROUP	N	MEAN	STANDARD DEVIATION	t	p
EXP	50	5.0926	1.117	.31	n.s
CONT	28	5.1713	1.015		

Findings by Group and by Race

In Table 4 the experimental and control groups were examined by race. The eleven white children in the experimental group had a mean of 3.785 on the pretest with a standard deviation of 0.925 and a mean of 5.062 on the posttest with a standard deviation of 0.945. The increase of 1.278 in the mean is significant at $p < .01$.

The thirty-five black children in the experimental group had a mean on the pretest of 4.220 with a standard deviation of 1.060 and a mean of 5.306 on the posttest with a standard deviation of 1.010. The increase from pre to post test of 1.087 in the mean is significant at $p < .01$.

The twelve white children in the control group had a mean of 3.962 on the pretest with a standard deviation of 1.161 and a mean of 4.875 on the posttest with a standard deviation of 1.262. This shows an increase of 0.91 in the mean is significant at $p < .01$.

The fourteen black children in the control group had a mean of 3.960 for the pretest with a standard deviation of 1.237 and a mean of 5.306 with a standard deviation of 0.700. The increase of 1.346 in the mean is significant at $p < .01$.

These results may be interpreted to mean that both the experimental and the control groups made significant increase in the average number of words per communication unit. None of the mean differences between gain scores of the experimental and control groups were significant. (Table 4)

TABLE 4

AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT:
MEANS, STANDARD DEVIATIONS AND MEAN DIFFERENCES
OF PREPOST TESTS BY GROUP AND BY RACE

GROUP	RACE	N	MEAN PRE	MEAN POST	STANDARD DEVIATION PRE	STANDARD DEVIATION POST	MEAN DIFF. (POST-PRE)
EXP	WHITE	11	3.785	5.062**	0.925	0.945	1.278
	BLACK	35	4.220	5.306**	1.060	1.010	1.087
CONT	WHITE	12	3.962	4.875**	1.161	1.262	0.914
	BLACK	14	3.960	5.306**	1.237	0.700	1.346
ALL	WHITE	23	3.877	4.965**	1.035	1.101	1.088
	BLACK	49	4.146	5.306**	1.106	0.924	1.161

MEAN **Sig. at p<.01 for both 1 and 2-tailed tests

WORDS IN MAZES AS PERCENTAGE OF TOTAL WORDS

Pre-Test Equivalency

In order to establish equivalency of the pretest scores of the experimental and the control groups, a t-test was performed on the average number of words in mazes as percentage of total words. The results show no significant difference between the experimental and the control groups.

Pre-Post Tests Comparison

The forty-eight children in the experimental group had a mean of 9.791 on the pretest with a standard deviation of 6.766 and a mean of 11.680 on the posttest with a standard deviation of 7.097. The increase of 1.890 in the mean from pre to post test is not significant. The twenty-eight children in the control group had a mean of 11.378 on the pretest with a standard deviation of 10.864 and a mean of 13.066 on the posttest with a standard deviation of 7.623. The increase of 1.688 in the mean from pre to post test is not significant. (Table 5)

TABLE 5

WORDS IN MAZES AS PERCENTAGE OF TOTAL WORDS: MEANS AND STANDARD DEVIATIONS OF PRE-POST TESTS BY GROUP

GROUP	N	MEAN		STANDARD DEVIATION	
		PRE	POST	PRE	POST
EXP	48	9.791	11.680	6.766	7.097
CONT	28	11.378	13.066	10.864	7.623

MEAN *t-test sig. at $P < .05$ for a one-tailed test

Post Test Results

In Table 6, the experimental group with a mean of 11.658 and a standard deviation of 6.961 shows no significant difference from the control group with a mean of 13.066 and a standard deviation of 7.623.

TABLE 6

WORDS IN MAZES AS PERCENTAGE OF TOTAL WORDS: MEANS AND STANDARD DEVIATIONS OF POSTTESTS BY GROUP

GROUP	N	MEAN	STANDARD DEVIATION	t	p
EXP	50	11.658	6.961	.83	.41
CONT	28	13.066	7.623		

Findings for Mazes by Group and by Race

Table 7 shows eleven children in the white experimental group had a mean of 7.075 on the pretest with a standard deviation of 6.237 and a mean of 10.847 on the posttest with a standard deviation of 7.372. The increase of 3.772 in the mean is not sifnificant. The thirty-five children in the black experimental group had a mean of 10.236 on the pretest with a standard deviation of 6.777 and a mean of 12.147 on the posttest with a standard deviation of 6.971. The increase of 1.911 in the mean is not significant.

The twelve white children in the control group had a mean of 9.267 on the pretest with a standard deviation of 6.077 and a mean

of 12.235 on the posttest with a standard deviation of 7.872. The increase of 3.019 in the mean from pre to posttest is not significant. The fourteen children in the black control group had a mean of 13.186 on the pretest with a standard deviation of 14.235 and a mean of 14.444 on the posttest with a standard deviation of 7.781. The increase of 1.258 in the mean from pre to post is not significant.

These results may be interpreted to mean that no significant increase on words in mazes as percentage of total words for blacks and whites in both experimental and control groups.

TABLE 7

WORDS IN MAZES AS PERCENTAGE OF TOTAL WORDS: MEANS, STANDARD DEVIATIONS AND MEAN DIFFERENCES OF PRE-POST TESTS BY GROUP AND BY RACE

GROUP	RACE	N	MEAN		STANDARD DEVIATION		MEAN DIFF. (POST-PRE)
			PRE	POST	PRE	POST	
EXP	WHITE	11	7.075	10.847	6.237	7.372	3.772
	BLACK	35	10.236	12.147	6.777	6.971	1.911
CONT	WHITE	12	9.267	12.285	6.077	7.872	3.019
	BLACK	14	13.186	14.444	14.235	7.781	1.258

Conclusions and Discussions

This study reveals results which are mixed. Children in the experimental and the control groups showed some increases and some decreases in language skills as measured in this study.

Experiemental group children increased number of words used from pre to posttest and increased the average number of words in each communication unit. However, average number of communication units - independent clauses - decreased. Average number of mazes, possibly indicating verbal confusion but possibly also reflecting anxiety about talking with a previously unfamiliar investigator, also increased.

In the control group, communication units and average words used in the spontaneous speech decreased from pre to posttest. Also, number of mazes increased. Although average pre and post-test scores were greater for control than experimental children, declines in verbal skills were more pronounced for the control group children whose parents did not receive the special training. Nevertheless, this group also exhibited a gain in average words in each communication unit from pre to posttest.

The data are somewhat difficult to interpret. Data from large city school systems such as Detroit show that although upon entering school gaps in tested abilities of deprived and nondeprived children are not great, these gaps increase as the educational level increases. In Detroit, which has a large minority and a large culturally deprived population in the public school system, shows that while first graders have reading and math test scores only slightly

below national norms at the first grade level, these mean scores are nearly a year behind national norms by the time the children are in the fourth grade. The data in this study show some of these patterns, but the declines in the experimental group, where parents were involved, is less than in the control group, where parents did not participate. Thus, the experiment was perhaps effective in influencing the performance pattern, but not in reversing it, for these children. In some instances (on total number of words used, and words per communication unit) the children gained in language skills over the period of the study.

Some factors in the implementation of the study may have affected results. Although only parents of experimental group children received special training and were urged to carry out special tasks with their children at home, all children were in nursery school classes with teachers and aides who had received training in language skills development. Thus, school setting factors were constant for children in both groups, and only the involvement of the parents varied. Also, parents differed considerably in their participation in the project. Some of the experimental group parents attended all or most meetings and carried out the assigned tasks regularly with their children, while others did not. These factors were beyond the control of the experimenters. We depended on reports of parents on implementation of tasks and did not monitor this test.

The children were tested initially and in the posttest by investigators who were unfamiliar to them. While this avoided

certain biases which might have been present had they been tested by their teachers or other familiar persons, it also might have introduced in these very young children anxieties which affected their performances on the tests. The relatively short period during which the experiment was run might also have not allowed for changes to become apparent. For example, many of the tasks assigned for parents to carry out with their children (growing seeds for a science experiment) did not relate directly to the child's language development but encouraged parent-child cooperation on educational tasks. The effects of such programs may be long-range rather than short-range. Also, verbal interactions accompanying these tasks may have varied markedly from family to family.

In sum, this study indicates that parental involvement and their participation on tasks outlined in this study may have had some influence on certain aspects of language development, such as total words used in a period of spontaneous speech. In other areas, it seemingly had less effect. Children in both groups showed some overall declines in certain language abilities. The study suggests that parental involvement is only one factor which influences performances and that future research much probe in-class and out-of-class factors which can affect the verbal language performance of young children. Future research planned by this investigator will attempt to investigate some of these variables.

Loban used these measures to test children of kindergarten through grade twelve. This is the first attempt to apply these

measures to preschoolers, and some of the indicators, particularly communication units and mazes, may not be appropriate for this age level. These data do not clearly answer this question, but these measures may require modification for use with preschool children.

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